

SYLLABUS

DIVISION: Business and Engineering Technology

REVISED: Summer/2013

CURRICULA IN WHICH COURSE IS TAUGHT: Air Conditioning & Refrigeration

COURSE NUMBER AND TITLE: Air 136- Circuits & Controls III

CREDIT HOURS: 3 HOURS/WK LEC: 2 HOURS/WK LAB: 3 LEC/LAB COMB: 5

- I. CATALOG DESCRIPTION:** Introduces types of circuits and controls used in home, commercial and industrial air conditioning systems. Includes servicing and installation procedures for electrical unloading of compressors, single-and two-stage thermostats, and electrical regulation of fan speed for air volume control. Explains operational and safety control and how schematic and pictorial diagrams are used in these systems.
- II. RELATIONSHIP OF THE COURSE TO CURRICULA OBJECTIVES:**
- Acquire an understanding of Alternating Distribution Systems
 - Gain an understanding of Electric Motors
 - Acquire the ability to diagnose and troubleshoot A.C. and D.C. motors
- III. REQUIRED BACKGROUND/PREREQUISITIES:**
- Air 134 or Approval
- IV. COURSE CONTENT:**
- Review fundamentals of Electricity
 - Power Distribution Systems
 - Electric Motor Principles (A.C. and D.C. Motors)
 - Start and Run Capacitors
- V. THE FOLLOWING GENERAL EDUCATION OBJECTIVES WILL BE ADDRESSED IN THIS COURSE**

- **Communications**
 - 1.1 understand and interpret complex materials;
 - 1.3 use standard English;
 - 1.5 use listening skills; and
- **Critical Thinking**
 - 2.4 weigh evidence and decide if generalizations or conclusions based on the given data are warranted;
 - 2.5 determine whether certain conclusions or consequences are supported by the information provided; and
 - 2.6 use problem solving skills.
- **Quantitative Reasoning**
 - 6.1 use logical and mathematical reasoning within the context of various disciplines;
 - 6.2 interpret and use mathematical formulas;
 - 6.3 interpret mathematical models such as graphs, tables and schematics and draw inferences from them;
 - 6.4 use graphical, symbolic, and numerical methods to analyze, organize, and interpret data;

VI. LEARNER OUTCOMES

VII. EVALUATION

Review Fundamentals of Electricity <ul style="list-style-type: none">• Understand the theory of basic electricity and the knowledge of how it operates.• Identifying basic electrical components• Ability to describe and explain how electricity works	Evaluation method Lab exercises Written test
Power Distribution Systems <ul style="list-style-type: none">• Understand how 3 phase and single phase power distribution systems work• Ability to distinguish the difference between the types of 3 phase distribution systems and single phase power distribution• Identify the different types of panel boxes and supply transformers	Evaluation method Lab exercises In class assignments Written test
Electric Motor Principles (A.C.) <ul style="list-style-type: none">• Understand the different types of motors used in the HVAC field• Ability to troubleshoot and repair A.C. motors• Identify the parts of a motor• Ability to identify the different types of motors	Evaluation method Lab exercises Research assignments Written test
Electric Motor Principles (D.C.) <ul style="list-style-type: none">• Understand the theory and how a D.C. drive motor operates• Ability to troubleshoot and repair D.C. motors• Identify the parts of a D.C. Motor	Evaluation method Lab exercises Research assignments Written test
Start and Run Capacitors <ul style="list-style-type: none">• Understand how a run and start capacitor works• Ability to diagnose an open or shorted capacitor, and the ability to read the microfarads• Identify the difference between a run and start capacitor	Evaluation method Lab exercises In class assignments Written test